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# Challenges for Small and Behind the Meter Generation

Wind Powering America  
New England Regional Wind Power  
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# Challenges

- Creating methods to capture the value of distributed renewables
- Accessing wholesale energy and capacity markets for excess generation
- Ensuring adequate treatment of renewables in Northeast RTO process
- Working through distribution company concerns over revenue losses



# Capturing the Value - Unbundling

- Major step forward in New England – acceptance of the concept of “unbundling”
  - ❖ Separates the environmental attributes of electric power from the energy commodity
  - ❖ Allows distributed renewable generators to:
    - Capture value of the electrons through sale of energy in wholesale market or through displacement of retail load behind the meter
    - Capture value of the attributes through separate market
- Various policies adopted under restructuring that require the collection of information regarding fuel and emission mix for load serving entities
  - ❖ Several methods developed to verify compliance
    - Contract path-based accounting
    - Certificates-based accounting





# Generation Information System

- GIS under development in New England
  - ❖ accounting system that offers flexibility in supporting public policy initiatives as well as facilitating green power market development
  - ❖ GIS will facilitate a market for certificate trading
  - ❖ GIS will use ISO settlements system for much of needed data
- GIS will accommodate behind the meter generation
  - ❖ Sun Power team currently developing metering/communication protocols
- Work to expand/develop similar systems in PJM and NY under way



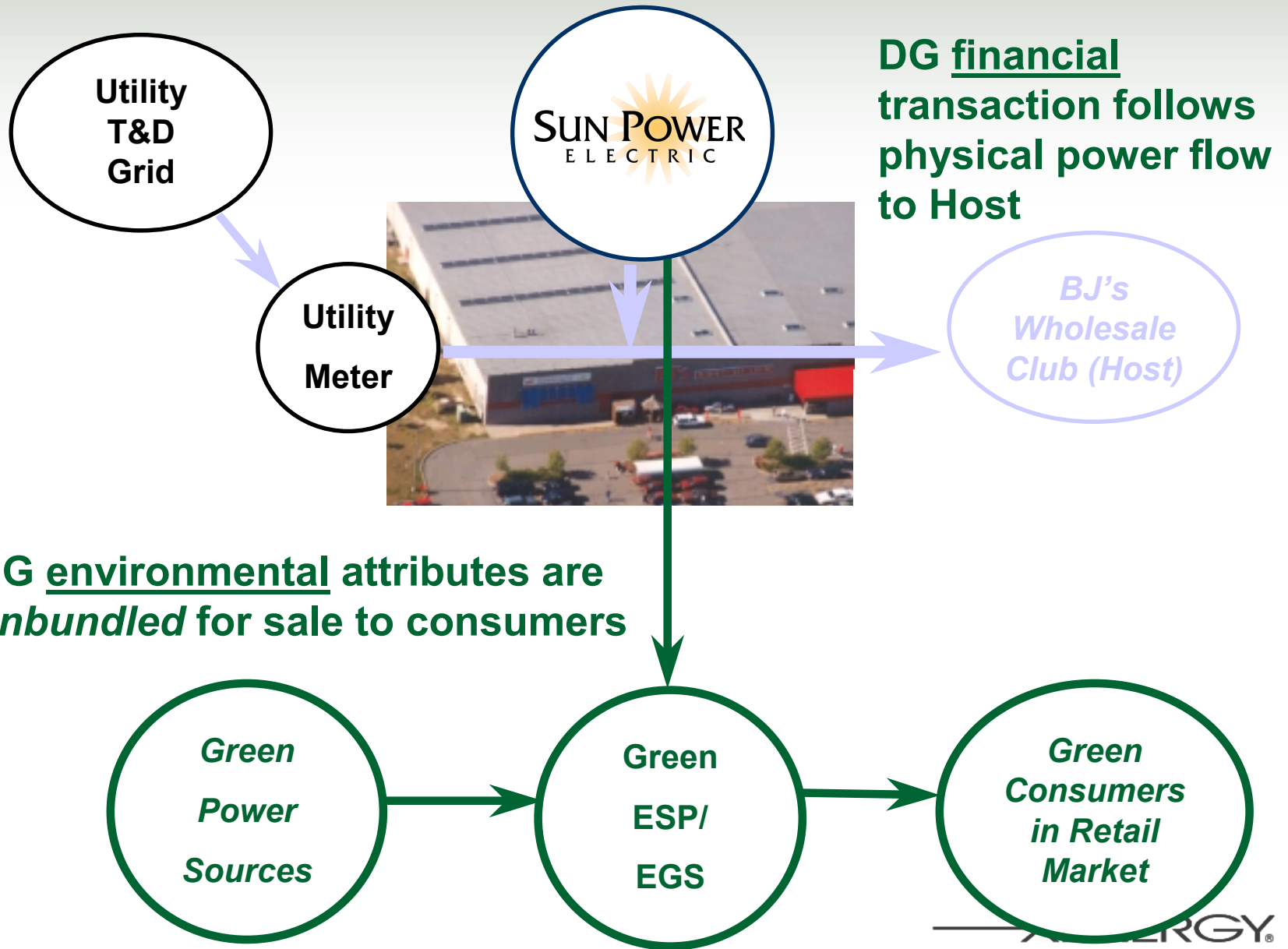


# Capturing the Value - Sun Power Electric Model

## ■ Multiple DG Revenue Streams

- ❖ **Base Electricity Commodity Value**
- ❖ **Environmental Attributes**
- ❖ **Additional Host Benefits**
  - On-site Peak Load Reduction
  - Reduction in T&D or Other Utility Charges
  - Reliability
  - Power Quality
- ❖ **Distribution Utility Benefits**
  - Reliability
  - Lower Costs
  - Lower Losses







# Capturing the Value - RPS

- CT, MA and ME are implementing renewable portfolio standards
- MA RPS – treatment of small and behind the meter generation
  - ❖ “Small Generation Units” – those units whose output is not reported to or monitored by the New England Power Pool may qualify as New Renewable Generation Units provided they meet all relevant eligibility requirements
  - ❖ Also assurances of no double-counting and must be in-state if behind the meter
- MA RPS, in conjunction with GIS, creates market and demand for renewables generation in which distributed resources can participate





# Capturing the Value – Net Metering

- All six New England states have net metering provisions

State	Technology	Size Limit (kW)	Customer Class	Scope	Statewide Limit
CT	Renewables and fuel cells	No limit	Residential	IOUs	None
MA	Onsite including renewables and cogen	60	All classes	All utilities	None
ME	Renewables and fuel cells	100	All classes	All utilities	None
NH	Solar, wind, and hydro	25	All classes	All utilities	0.05% of utility's annual peak
RI	Renewables and fuel cells	25	All classes	IOUs	1 MW for Narragansett Elec.
VT	Solar, wind, fuel cells, farm biogas	15 except 100 for biogas	All classes	All utilities	1% of 1996 peak







# Gaining Access to Wholesale Energy and Capacity Markets

- Rules governing the wholesale markets were designed to accommodate centralized generating plants and have not been adequately updated to reflect the realities of new dispersed resources
  - ❖ Limited recognition of small resources (< 1 MW and between 1 and 5 MW)
    - ISO software cannot recognize bids in increments of less than 1 MW
    - Generation between 1 and 5 MW are currently dealt with as netted load or as “Settlement Only” generators
    - Lack of access to ancillary services and capacity markets





# Benefits of Gaining Access to Wholesale Markets

- Analysis of hourly patterns of ISO-NE electricity prices and PV generation
- Showed that Sun Power would receive 14% more revenue from selling the PV at the actual spot market price than selling at the average ISO spot price over the same period
  - ❖ Average spot price = \$47.58
  - ❖ Average revenue if sold at actual spot price = \$54.08
- Analysis also shows an additional 28% on top of this for value of capacity



# Northeast RTO Development

- Northeast RTO – ISO-NE, NYISO and PJM
  - ❖ Governance – working to create stakeholder governance process that provides for substantive participation of renewable energy, distributed power, etc.
  - ❖ Best practices – negotiations, discussions regarding practices of ISONE and NYISO and elsewhere that will be implemented as part of PJM platform
  - ❖ Outcome of these and other issues will have effects for renewables generation in New England in the future



# Conclusions

- Some good opportunities for distributed renewables currently
  - ❖ Net metering, GIS, RPS, innovative retail models
- Wholesale market opportunities, while they may be lucrative, will be very difficult to effect
  - ❖ But, have opportunity to shape NERTO

